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ABSTRACT

Overall enrollment trends (changes) in each sector (state-owned, state-related, community colleges, state-aided, and private colleges and universities) of Pennsylvania higher education over the last 10 years are examined and the conditions that impact on these changes are identified. The variables included for the analysis are divided into four groups: demographic, economic, costs (such as tuition), and equalizers (such as financial grants). Data are presented indicating that although there are differences in the cost of a postsecondary education among the five sectors, there are indications that these differences are decreasing. Related research suggesting that increasing costs are related to declining enrollment is summarized. For those variables selected, data were originally collected from 1967 through 1976 by higher education sector. The correlation of the demographic variables with full-time freshman enrollment changes in the five sectors seems to indicate a high relationship. The statistical relationship between the community colleges and the state-aided and private colleges was found to be negative as was the relationship between the state- related and private colleges. (SPG)

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FULL-TIME FRESHMAN ENROLLMENTS AND DEMOGRAPHIC, ECONOMIC AND COST CHANGES

HE 009 715

Prepared by:
Task Force on Higher Education Enrollments
Bureau of Information Systems
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November 1977

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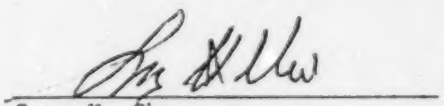
In an effort to assist the Office of Higher Education's decision making, the Bureau of Information Systems has been analyzing funding, enrollments, workload and programs in higher education. The first working paper examines enrollment changes for a 10-year period.

The work has been completed by Roger Hummel, Greig Mitchell, John Senier, Frank Durkee and John Kehoe. Special acknowledgment for the clarity of the text is expressed to John Kehoe.



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Introduction

Between 1946 and 1976, postsecondary education in Pennsylvania grew at an unprecedented rate. In 1946 there were 101,751 full-time and 32,287 part-time students. By 1976 enrollments increased to 336,820 full-time and 152,097 part-time students. During this period, there was an accompanying increase in the number of degree-granting institutions from 78 in 1946 to 190 in 1976. However, recent trends in freshman enrollments and decreasing births since 1957 indicate that postsecondary institutions may experience an extended period of decline in full-time enrollments. Full-time freshman enrollment declined in 1976 and this could continue until 1996.

Most administrators and planners of postsecondary institutions have had to consistently plan for expanding enrollments. The portending period of shrinking enrollments and its possible consequences for postsecondary education in terms of staff, use of facilities and the operating budget will be a totally new experience. In an effort to provide insights into the possible future of higher education in Pennsylvania, the Bureau of Information Systems plans to develop a series of working papers analyzing trends in higher education.

The purpose of this first working paper is to examine overall enrollment trends in each sector of Pennsylvania higher education over the last 10 years and to identify the conditions which impact upon these changes. Incorporated in this analysis are demographic, economic and financial variables that have been selected based upon an existing body of knowledge or intuitive considerations. It is anticipated that this analysis can assist policy makers in enabling them to more accurately predict future enrollment trends and to recommend those policy alternatives essential for institutional stability.

Statement of the Problem

Recent declines in enrollments at some postsecondary institutions, both nationally and in Pennsylvania, have become a source of concern. Unfortunately, little is known about the factors that influence enrollment changes. Combinations of demographic, socioeconomic and cost variables all tend to play a part in influencing past enrollments and shaping future enrollment trends.

Demographic

College freshman enrollments in Pennsylvania during the 70s reflect an inconsistent trend characterized by small growth.

Table 1 illustrates the trend in full-time freshman enrollments over the past decade.

Table 1

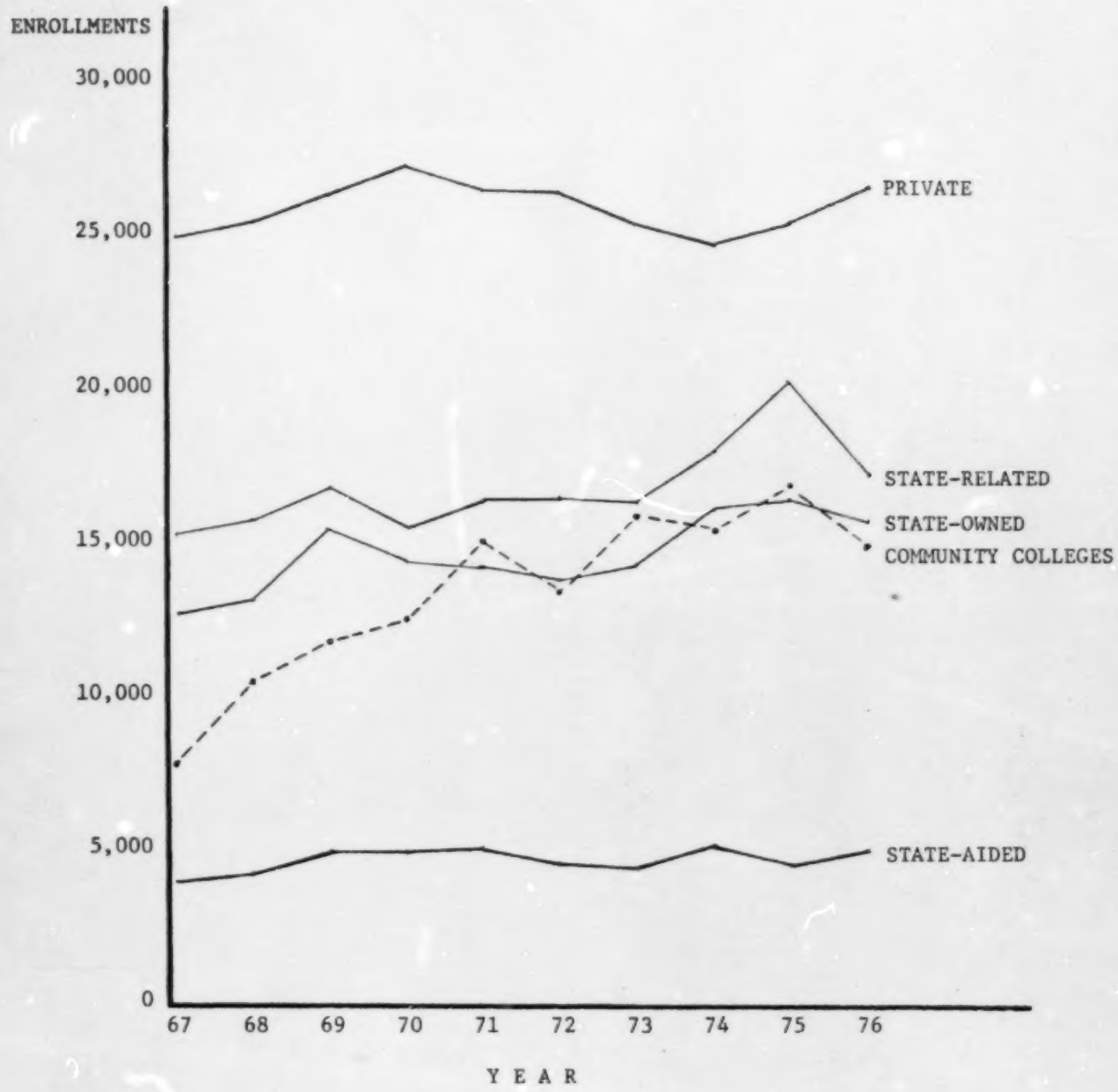
Full-Time Freshman Enrollment and Annual Percentage Changes in Enrollment by College Sector 1967-1976[1]

Year	State-Owned		State-Related		Community Colleges		State-Aided		Private	
	#	% Chg.	#	% Chg.	#	% Chg.	#	% Chg.	#	% Chg.
1967	12,534	-	15,089	-	7,538	-	3,887	-	24,773	
1968	13,000	3.7	15,514	2.8	10,290	36.5	4,018	3.4	25,304	2.1
1969	15,254	17.3	16,579	6.9	11,581	12.5	4,873	21.3	26,142	3.3
1970	14,279	-6.4	15,279	-7.8	12,311	6.3	4,878	0.0	27,113	3.7
1971	14,022	-1.8	16,201	6.0	14,893	21.0	4,962	1.7	26,320	-2.9
1972	13,607	-3.0	16,301	1.0	13,353	-10.3	4,470	-9.9	26,234	0.0
1973	14,118	3.8	16,188	-1.0	15,779	18.2	4,192	-6.2	25,196	-4.0
1974	15,946	12.9	17,906	10.6	15,333	- 2.8	4,925	17.5	24,535	-2.6
1975	16,309	2.3	20,028	11.9	16,680	8.8	4,417	-10.3	25,277	3.0
1976	15,514	-4.9	17,028	-15.0	14,893	-10.7	4,835	9.5	26,490	4.8

This trend can be readily seen in Figure I (p.3).

[1] Our Colleges and Universities Today, Summer and Fall College Enrollments, Vols. V-XIV.

FIGURE 1 -- Full-Time Freshman Enrollments by Sector
Fall 1967-1976



Socioeconomic and Cost

There has been a steady increase in the cost of attending college. It has been argued that these rising costs have had the effect of pricing certain segments of the population out of the college market. The impact of increased costs has traditionally been felt by the lower income groups. As a response to this inequity, financial aid programs have been established to enable those qualified students to participate in higher education who could not otherwise afford to attend. It is the middle-income group, however, (largely ineligible for financial assistance) that is finding it increasingly difficult to bear the entire cost of a college education. Table 2 illustrates this trend.

Table 2

Percentage Changes in College Students by Parental Income from 1972 to 1975[2]

	Under $7,500*	$7,500-12,000*	Over $12,000*
State-Owned	+ 21.2	- 13.4	+ 7.4
State-Related	+ 4.7	- 9.0	+ 35.3
Community Colleges	+ 53.6	- 14.0	+ 18.0
Private (including State-Aided)	+ 10.1	- 14.0	+ 1.0

*Due to the magnitude of inflation experienced between 1972 and 1975, the upper limits of the 1975 "under $7500 and $7500-12,000" categories were extended to $8625 and $13,800, respectively, to obtain 1972 equivalents. The lower limits of the "$7500-12,000" and "over $12,000" categories were similarly extended to $8625 and $13,800, respectively, for 1975.

The role of tuition pricing has helped to contribute to the strengthening of the competitive posture of some sectors. Table 3 illustrates this point.

Table 3

Average Tuition and Percentage Changes in Tuition by College Sector 1967 and 1976[3]

	TUITION				
	1967 $	1976 in Current $	1976 in 1967 $	Per Cent Change Current $	Per Cent Change 1967 $
State-Owned	250	878	492	251	97
State-Related	450	1,198	671	166	49
Community Colleges	326	546	306	67	- 6
State-Aided	1,241	3,110	1,742	151	40
Private	1,353	2,466	1,381	82	2

As the above table indicates, the average tuition charges (in 1967 dollars) for the state-owned colleges increased more than any other sector (97 per cent) over the 10-year period. The state-related universities, by contrast, only experienced tuition increases of 49 per cent when measured in real 1967 dollars. State-aided real tuition increases were 40 per cent over the 10-year period.

Tuition at the community colleges has actually decreased six per cent over the 10-year period when measured in 1967 dollars. The effect of pricing tuition at a lower rate than inflation may have been an important factor in this sector's phenomenal growth rate during the last decade.

[2]Source: Student Resources Survey, PHEAA, 1975 and 1977.

[3]Source: Our Colleges and Universities Today and Tuition and Required Fees and Room and Board Charges at Institutions of Higher Education in Pennsylvania.

The private colleges experienced real tuition increases of only two per cent since 1967. The effect of tuition pricing has enabled this sector to compete more effectively in relation to other colleges. In 1967, the average tuition at the private colleges was almost five and one-half times as much as the state-owned colleges. By 1976, it was about three times as high. Similarly, tuition at state-related colleges was one-third that of the private colleges in 1967 but by 1976 it had risen to one-half.

Although room and board costs have increased in the last 10 years, the real costs of these charges (when measured in 1967 dollars) has declined in every sector. Table 4 shows this trend

Table 4

Room and Board Charges and Percentage Changes by College Sector 1967 and 1976[4]

	ROOM AND BOARD CHARGES				
	1967 $	1976 in Current $	1976 in 1967 $	Per Cent Change Current $	1967 $
State-Owned	612	954	534	56	- 13
State-Related	1,095	1,568	878	43	- 20
Community Colleges	-	-	-	-	-
State-Aided	935	1,437	805	54	- 14
Private	900	1,367	765	52	- 18

The above table indicates that there is little difference among the sectors in room and board costs. All of the sectors have tended to lag behind inflation. This again illustrates how the private colleges are maintaining their competitive position when compared to the public sector.

As this section indicates, although there are differences in the cost of a postsecondary education among state-owned, state-related, community colleges and private colleges and universities, there are indications that these differences are decreasing. Twenty years ago the tuition gap between public and nonpublic sectors was about 2:1; 10 years ago it was over 3:1; now it has declined to approximately 2.5:1. It is these differences, or lack of differences, that have influenced (and may continue to influence) a student's choice of college. As higher educational opportunities become limited to certain income groups and birth rates continue to decline, public colleges and universities will be placed in even greater competition with private colleges and universities for a diminishing pool of students who can afford a college education. If the Commonwealth is to continue providing universal access to all students who can benefit from a college education, a serious examination of these trends is imperative.

Review of Related Research

Research in the college attendance decision area has basically taken two perspectives, the sociologic and economic.

The sociologic perspective examines the exploratory nature of the research reflecting the causative effects of combinations of demographic and psychological variables upon college attendance. These studies are primarily concerned with the

[4]Source: Our Colleges and Universities Today and Tuition and Required Fees and Room and Board Charges at Institutions of Higher Education in Pennsylvania.

effects and correlates of social class. An examination of many sociological variables, however, produces findings, which tend to be inconsistent, with variation occurring through differences in sampling technique or analytical method employed. In several studies (Douvan and Kaye, 1967; Sewell and Shah, 1968; Trent and Medsker, 1968; State University of New York, 1969 and 1970; Berls, 1969; Folger, Astin and Boyer, 1970 and Tillery and Kildegaard, 1973) parental encouragement was found to be a significant factor in college attendance. Other factors, such as aptitude (Berdie and Hood, 1966: Cowhig and Nam, 1959); interest (Trent and Medsker, 1968; Berls, 1969; Cowhig and Nam, 1959 and 1960); financial aid (Boyd and Tenske, 1975; Fife, 1975; Munday, 1976, and Leslie, Johnson and Carlson, 1977); and high school curriculum (Cowhig and Nam, 1960; Leslie, Johnson and Carlson, 1977) also proved to be significant predictors.

In the last decade, cost-enrollment studies have become increasingly important in determining the overall effect pricing policies might have upon different economic groups. These studies have taken the economist's perspective by examining relationships (as opposed to causes) and have utilized the existing data base employed by the sociologists. As a result, a greater emphasis on the combination of economic variables (such as family income, tuition, room and board, and opportunity costs) has occurred.

Of all the studies grouped under this classification, the Campbell and Siegel (1967) study is generally acknowledged to be the first important research on student access. Utilizing the variables of income, tuition and number of students as an investment approach to educational demand theory, the authors concluded that a 10 per cent increase in average real tuition has been associated with a 4.4 per cent enrollment decrease. Galper and Dunn (1969), after examining the relationship between induction and discharges from the armed services and four-year college enrollment, concluded that a 10 per cent rate of growth in the armed forces is associated with a 2.6 per cent decline in college enrollment. Hoenack (1967), by analyzing the effects of student cost, income and unemployment upon freshman enrollment, was able to estimate separate demand functions for each campus of the University of California. His findings indicated that a $100 tuition increase would decrease enrollment three to six percentage points, depending on family income and state college price changes. In a later study utilizing similar variables, Hoenack (1973) developed an analysis of enrollment demand at each college of the University of Minnesota. The results of this study showed that a $100 increase in tuition reduces enrollment 2.62 to 0.12 percentage points, depending upon the college. Corazzini (1972) employed economic and noneconomic factors, such as state average tuition, father's education, opportunity cost and academic achievement in order to simulate demand and supply side constraints. He concluded that a $100 decrease in tuition is associated with a 2.65 per cent increase in enrollment.

Studies concerned with student choice (the decision of which college to apply once access was obtained) have also produced significant findings. In an analysis of data from four states, Radner and Miller (1966) found that a $100 increase in the cost of attendance in one institutional sector would decrease enrollment in that sector from 3.26 to 0.71 percentage points, depending on family income and the particular institutional sector. Kohn, Manski and Mundel's study (1973), in simulating the results of several unobserved individual and institutional decisions, concluded that a $100 increase in tuition produces from .40 to .11 percentage point decrease in utility (the attractiveness of a college). Spies (1973) utilized linear equations representing student and school characteristics (such as income, SAT scores and tuition) in describing three different decisions: the decision to apply to any school, the decision to apply for financial aid and the decision to enroll once admitted. His findings indicated that a unit increase in cost/income led to a -6.72 percentage point change in enrollment. Jackson and Weathersby (1975) reanalyzed several of the above studies in determining a comparative "price responsiveness" ranging from -.06 to -1.9 percentage points change in enrollment ratio for each $100 increase in cost to the student.

In addition to this, two major studies incorporating financial aid simulations have yielded similar results. The National Commission on the Financing of Post-secondary Education (1973), treating changes in student grants like changes in tuition, estimated that an increase of $100 in tuition would reduce enrollment by 0.7 per cent among upper-income students, 1.2 per cent among middle-income students and 3.1 per cent among low-income students. Carlson (1975), in a nationwide analysis of federal student aid program modifications, concluded that for every $100 decrease in tuition, institutional enrollment would increase more than one per cent among students from families earning more than $12,000 annually and more than seven per cent from families earning less than $6000 annually.

At least one state tuition-lowering experiment has yielded similar results. Stampen (1974), in reporting on the University of Wisconsin policy, concludes that each $100 decrease in tuition at various campuses resulted in an enrollment increase between 4.8 per cent and 12.2 per cent above the average increase for the university.

Method of Analysis

Implicit in the concept of price-enrollment responsiveness is the notion of prediction. This has traditionally taken the form of a multiple regression equation using combinations of variables to predict certain outcomes. Although there are several methods that can be used to predict college enrollments, the multiple regression technique was determined to be preferable. This technique is considered to be a reliable instrument for prediction and is based upon a considerable body of theory. The multiple regression model permits the simultaneous analysis of many variables, some of which may be intuitively related.

It is this latter point that is most important when assessing the feasibility of any enrollment projection model. Certain variables that appeal to one's sense of reality may have a subtle interactive effect upon key variables. Such factors cannot be examined in isolation. It is only through an integrative analysis of variables that significant interrelationships can be established. Multiple regression analysis provides the mechanism for such an analysis.

Selection of Variables

The variables which were included for the analysis are divided into four groups--demographic, economic, costs (such as tuition) and equalizers (such as financial grants).

The potential demographic variables which define full-time freshman enrollments have been variously defined. Births, as a determinant of the eligible college population 18 years later, have been extensively used. The number of high school graduates, the number of high school graduates stating they intend to enter college and subsequent freshman enrollments in the fall have been shown to be related. Also, it was intuitively felt that changes in the number of vocational education graduates would have an inverse effect on college enrollment. Vocational education, as an educational alternative, is designed to prepare students for direct entry into the labor force. Thus, any change in the number of vocationally trained graduates was thought to affect the number of potential college students.

Of those economic variables cited by previous studies which are thought to influence enrollments, information was available on changes in the number of persons unemployed, average weekly earnings of production workers (AWE) and the consumer price index. As in the Corazzini study the variables of AWE and unemployment were entered as variables to represent opportunity costs. These costs represent the wages that could be earned if the student had not attended college. It can also be argued that an increase in AWE provides an incentive for potential college freshmen to enter or remain in the labor force. Conversely, an increase in unemployment stimulates an increase in freshman enrollments. By the same token, a rise in unemployment creates a labor surplus depressing the demand for labor as expressed by wages.

The consumer price index, a measure of inflationary trends, provides a relative index of costs to a particular base year. It is a key element affecting the direct cost of education. As such, the consumer price index, when used to deflate costs, permits a longitudinal comparison of changes in costs in terms of real dollars (in this case, 1967 dollars).

The measures of demand for postsecondary education, as expressed by the direct cost of going to college, are defined as tuition and room and board charges. The variable room and board has been included in several studies and has been found to be a determining factor. Room and board costs for the community colleges were not included because students enrolled at these colleges are almost exclusively commuters.

Financial aid as an equalizer serves to reduce the cost of postsecondary education. It also represents an effort index on the part of a postsecondary institution to attract students. This effort represents a standard which, like admission policies, can be independent of market forces.

It was intuitively felt that as the amount of financial aid increases relative to tuition, the importance of tuition as a factor in predicting college enrollment would decrease. Conversely, as the amount of financial aid decreases relative to tuition, tuition would play a more prominent role in determining freshman enrollments. For this reason, a support ratio was developed. This support ratio was calculated by dividing the total grants given to students of a postsecondary sector by the total tuition and fees collected from the students by the sector. The precedent for utilizing a ratio variable has previously been established. Campbell and Seigel (1967) developed a ratio of enrollment to students in the 18 to 24-year age group. Similarly, Spies (1973) utilized a ratio of cost to income in order to determine an "ability to pay" measure.

Analysis of Data

For those variables selected, data was originally collected for the years 1967 through 1976 by higher education sector. Subsequently, a correlation matrix was developed to determine the statistical relationship of all the variables with each other. (See Table 5, p. 9).

The correlations of the four demographic variables with full-time freshman enrollment changes of the five sectors seem to indicate a high relationship. Changes in the number of births 18 years earlier and high school graduates are highly correlated ($r = .90$). The high interrelationship suggests one of the variables is redundant. Since the changes in the number of high school graduates would have to be projected and information on births could be used for 18 years into the future, the variable births was preferred in projecting full-time freshman enrollments. Changes

Table 5

CORRELATIONS AMONG VARIABLES

Variables	Demographic Variables				Economic Variables			Cost Variables								Equalizer Variables										Dependent Variables		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1. Births 18 Years Earlier																														
2. Vocational Education Graduates	.76																													
3. High School Graduates	.90	.86																												
4. High School Graduates to College	.59	.46	.71																											
5. Unemployment	.24	-.11	.10	.06																										
6. Consumer Price Index	.10	.25	-.01	.18	-.27																									
7. Average Weekly Earnings	-.27	-.02	-.26	-.41	-.56	-.12																								
8. Tuition, State-Owned	.05	.19	.15	.26	.09	.32	-.68																							
9. Tuition, State-Related	.50	.41	.55	.76	-.09	.34	-.42	.63																						
10. Tuition, Community Colleges	-.50	-.23	-.41	-.41	-.52	-.19	.88	-.77	-.65																					
11. Tuition, State-Aided	-.47	-.18	-.44	-.53	-.46	.04	.13	.40	-.08	.04																				
12. Tuition, Private	.23	.19	.33	.47	-.03	.14	.08	-.23	.26	.12	-.77																			
13. Room and Board, State-Owned	.58	.17	.50	.47	.19	-.35	.05	-.20	.49	-.20	-.48	.38																		
14. Room and Board, State-Related	-.75	-.66	-.61	-.18	-.20	-.41	.28	-.09	-.19	.42	.36	-.26	-.09																	
15. Room and Board, State-Aided	.28	-.03	.08	.06	.36	-.09	-.29	-.15	-.20	-.20	-.01	-.59	-.05	-.08																
16. Room and Board, Private	.44	.33	.47	.55	-.19	-.03	.43	-.57	.23	.35	-.67	.66	.66	-.09	-.11															
17. Grants, State-Owned	.17	.17	.14	.04	.13	.39	-.75	.67	.20	-.67	.29	-.34	-.49	-.47	.28	-.68														
18. Grants, State-Related	-.08	-.15	-.20	-.12	-.25	.41	.14	-.51	-.42	.39	-.27	.23	-.37	-.28	.19	.16	.13													
19. Grants, Community Colleges	-.19	-.25	-.26	-.08	-.33	.38	.22	-.52	-.35	.46	-.33	.44	-.28	-.17	-.07	.26	-.03	.95												
20. Grants, State-Aided	-.16	-.39	-.27	.07	.30	-.11	.22	-.66	-.41	.42	-.53	.15	.08	.32	.40	.43	-.53	.37	.36											
21. Grants, Private	.52	.38	.60	.67	-.32	.17	-.05	-.15	.50	-.05	-.53	.71	.51	-.37	-.23	.68	-.07	.31	.41	-.09										
22. Support Ratio, State-Owned	-.74	-.44	-.62	-.64	-.15	-.21	.11	-.04	-.70	.40	.58	-.56	-.80	.47	.15	-.65	.20	.16	.08	.01	-.61									
23. Support Ratio, State-Related	-.45	-.29	-.47	-.58	-.45	-.02	.69	-.75	-.77	.86	.04	.08	-.39	.11	-.09	.13	-.32	.72	.73	.32	-.01	.46								
24. Support Ratio, Community Colleges	-.32	-.29	-.37	-.31	-.31	.23	.42	-.64	-.55	.63	-.28	.44	-.31	-.10	-.22	.22	-.19	.87	.95	.35	.26	.20	.87							
25. Support Ratio, State-Aided	-.22	-.39	-.31	.02	.24	-.12	.31	-.70	-.45	.52	-.52	.20	.06	.36	.30	.45	-.60	.37	.39	.99	-.10	.05	.39	.41						
26. Support Ratio, Private	.35	.24	.44	.51	-.48	.05	.21	-.32	.35	.21	-.46	.73	.48	-.21	-.35	.74	-.27	.35	.69	-.03	.96	-.51	.20	.40	-.01					
27. Full-Time Freshmen, State-Owned	.54	.25	.54	.58	-.33	-.14	-.01	-.20	.43	-.06	-.22	.17	.60	-.12	.25	.58	.67	.13	.12	-.02	.77	-.45	.10	-.07	-.07	.73				
28. Full-Time Freshmen, State-Related	.50	.04	.32	.49	.20	.07	-.22	-.36	.10	-.12	-.52	.07	.34	.22	.72	.46	.02	.46	.33	.55	.43	-.35	-.03	.11	.47	.32	.65			
29. Full-Time Freshmen, Community Colleges	-.22	-.49	-.29	.35	-.11	.46	-.45	.14	.43	-.31	.01	.09	-.07	.22	.05	-.09	.29	.26	.33	.12	.26	-.11	-.21	.09	.07	.17	.20	.32		
30. Full-Time Freshmen, State-Aided	.27	.36	.58	.53	-.39	-.32	-.04	.04	.36	.04	-.17	.41	.31	-.02	-.28	.38	-.03	-.08	.02	-.33	.73	-.15	-.08	-.05	-.31	.72	.65	.05	-.05	
31. Full-Time Freshmen, Private	.20	.33	.38	.40	.31	-.18	-.25	.56	.57	-.44	-.05	.12	.37	.12	-.33	.03	-.12	-.89	-.80	-.28	-.11	-.35	-.78	-.77	-.27	-.19	.17	-.40	-.17	.16

in the number of vocational education program graduates was also retained as a variable because preliminary analysis indicated that an inverse relationship exists between this variable and full-time freshman enrollments. The correlations between AWE and full-time freshman enrollments are all negative, confirming previous studies which also found an inverse relationship between these two variables. Similarly, there is an inverse relationship ($r = -.56$) between AWE and unemployment, which is a confirmation of the supply/demand function of labor and wages.

It was assumed at the outset of this study that there were significant differences in the full-time freshman enrollment patterns of the five postsecondary sectors. The correlations between full-time freshman enrollment changes of the five sectors confirm this assumption. The statistical relationship between the community colleges and the state-aided and private colleges is negative (-.05 and -.17), respectively). This relationship may indicate that as enrollments at community colleges increase, enrollments at state-aided and private colleges tend to decrease (or vice versa). Similarly, there is a negative relationship (-.40) between the state-related and private colleges which reflects that as the per cent of total freshman attending the state-related colleges has increased, the per cent of total freshmen attending private colleges has tended to decline (or vice versa).

Results

The results of this analysis can be directly compared with the results of the major cost-enrollment studies summarized in the table below.

Table 6

Summary of Major Tuition-Enrollment Studies

Reference	Tuition Increase	Enrollment Decrease
Campbell and Siegel	10%	4.4%
Hoenack (1967)	$100	3 to 6 percentage points
Hoenack (1973)	$100	2.62 to 0.12%
Corazzini	$100	2.65%
Radner and Miller	$100	3.26 to .71%
NCFPE	$100	0.7% upper-income; 1.2% middle-income 3.1% low-income
Carlson	$100	1%--over $12,000 7%--less $ 6,000
Kohn, Manski and Mundel	$100	.40 to .11% (attractiveness)
Spies	1 unit (cost/income)	6.72%

Our preliminary findings tend to confirm most of the conclusions presented above for most sectors.[5] This indicates that, by holding all other factors constant, increases in tuition tend to exert a downward influence upon full-time freshman enrollment. The conclusions reported by Kohn, Manski and Mundel, and Spies, could not be confirmed by this analysis. A further refinement of the variables used in these studies would be necessary in order to include similar decisional considerations.

[5] "Trends in Higher Education," Working Paper No. 1. Task Force on Higher Education Enrollments, October 1977, pp. 20-49.

It should be noted, however, that two important variables, family income and financial aid, have not been included in the selection of variables. Data pertaining to these two variables were not available for all of the years. The significance of these two variables has been well documented in the literature and their inclusion in the analysis can significantly alter any existing relationship among the 10 variables. It was, therefore, felt that the final analysis of the effects of tuition on enrollment would have greater validity if viewed more comprehensively over a shorter period of time. The only information available on the socioeconomic characteristics of students by college sector is that gathered by the Pennsylvania Higher Education Assistance Agency on the 1972-73 and 1975-76 enrolled students. This information was gathered from a sample of students using the Student Resource Survey questionnaire developed by the College Entrance Examination Board. This cross-sectional data of student background may provide a more viable data base whereby all relevant variables can be effectively analyzed.

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